STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF APPROVING A NEW CONTAMINANT SOURCE FOR GOLDENDALE ENERGY CENTER	)))	ORDER NO. 01AQCR-2037 First Revision

To: Goldendale Energy Center
600 Industrial Way
Goldendale, WA 98620

1.0 PROJECT SUMMARY

On August 15, 2001, Ecology received a proposal for the installation and operation of the Goldendale Energy Center (GEC). The GEC will be a nominal 248.7 megawatt (MW) combined cycle, electric generating facility. The source will consist of a combustion gas turbine-driven generator and a steam turbine driven generator. The combustion turbine and supplemental duct burners will burn natural gas. The exhaust heat from the combustion turbine flows to a heat recovery steam generator (HRSG) to produce steam. Steam is directed to the steam turbine, which turns a steam turbine generator. Steam exhausted by the steam turbine generator flows to a cooling tower and/or air-cooled condenser, is condensed, and returned to the HRSG. The HRSG will be equipped with a 323 million Btu/hr (LHV) duct burner that will produce up to 40 MW of the total power production of 248.7 MW. Since performance of the combustion turbine declines as ambient air temperature increases, the maximum duct burner contribution of 40 MW will occur when the ambient site temperature reaches its maximum (about 110 °F).

Selective catalytic reduction (SCR) will be installed at the appropriate section of the HRSG to minimize NO_X emissions from the combustion turbine. An aqueous ammonia tank will supply the HRSG unit with ammonia for use with the SCR. An oxidation catalyst will also be installed in the HRSG to oxidize carbon monoxide (CO) and, to a lesser extent, volatile organic compounds (VOCs) to carbon dioxide (CO_2).

Additional emission units include a 300 horsepower (hp) diesel engine, to start automatically should a demand for water for fire suppression occur simultaneously with a loss of electric power and a 536 hp (400 kW) diesel backup generator, to supply critical AC loads during emergency situations.

Following issuance of Order No. 01AQCR-2037, it was discovered that the sulfur content of the natural gas, used in much of Washington State including that expected to be used in the GEC, is greater than had been previously recognized. To remedy this situation, and minimize the potential for underestimating emissions, the permittee requested, on July 15, 2002, that the permit be revised to reflect more accurate sulfur related emissions

estimates. Ecology hereby grants this request subject to certain conditions. Order No. 01AQCR-2037 First Revision supercedes Order No. 01AQCR-2037.

The GEC will be located within the City of Goldendale, in Washington within the SE 1/4 of the SW 1/4 and the SW 1/4 of the SE 1/4 of Section 20, Township 4 North, Range 16 East, Willamette Meridian, Klickitat County.

In relation to the above, the Department of Ecology, State of Washington, pursuant to RCW 70.94.152, makes the following determinations:

1.1 The proposed project, if constructed and operated as herein required, will be in accordance with applicable rules and regulations, as set forth in Chapter 173-400 WAC and Chapter 173-460 WAC.
1.2 Operation of the proposed project, at the location proposed, will not result in ambient air quality standards being exceeded.
1.3 The proposed project, if constructed and operated as herein required, will employ best available control technology.

THEREFORE, IT IS ORDERED that the project as described in said Notice of Construction and more specifically detailed in plans, specifications and other information submitted to the Department of Ecology in reference thereto, is approved for construction, installation and operation, provided the following conditions are met:

2.0 DESCRIPTION

2.1 LAWS AND REGULATIONS

This proposal qualified as a new source of air contaminants under Washington Administrative Code (WAC) 173-400-110, November 22, 2000; and WAC 173-460-040, July 21, 1998.

The proposed project shall comply with all current state laws and regulations, including Revised Code of Washington (RCW) 70.94, Washington Clean Air Act; Chapter 173-400 WAC, General Regulations for Air Pollution Sources; Chapter 173-460 WAC, Controls for New Sources of Toxic Air Pollutants; Chapter 173-406 WAC, Acid Rain Regulation; RCW 43.21C, State Environmental Policy Act; Chapter 197-11 WAC, SEPA Rules; and WAC 173-802, SEPA Procedures.

The proposed project shall also comply with Title 40 Code of Federal Regulations (CFR) Part 60, Subpart Da, Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978; Title 40 CFR Part 60, Subpart GG, Standards of Performance for Stationary Gas Turbines; Title 40 CFR Part 72, (Acid Rain) Permits Regulation; Title 40 CFR Part 73 (Acid Rain) Sulfur Dioxide Allowance System; Title 40 CFR Part 75, (Acid Rain) Continuous Emission

Monitoring; and Title 40 CFR Part 76, Acid Rain Nitrogen Oxides Emission Reduction Program.

2.2 ESTIMATED EMISSIONS

As permitted, the source may produce up to the following annual emissions:

Pollutant	Emissions	
Oxides of nitrogen	76.7	tons per year
Carbon monoxide	83.7	tons per year
Sulfur dioxide	30	tons per year
Volatile organic compounds	42.2	tons per year
PM_{10}	98.9	tons per year
Toxic Air Pollutants		
Acetaldehyde*	3091.1	pounds per year
Ammonia*	115,010 / 69,006**	pounds per year
Benzene*	321.6	pounds per year
Formaldehyde*	3955.9	pounds per year
PAH*	13.8	pounds per year
Propylene Oxide*	481.8	pounds per year
Sulfuric Acid Mist*	6.2	tons per year

* Toxic air pollutant with estimated emissions greater than the Small Quantity Emission Rate listed in WAC 173-460-080(2)(e).
** 115,010 pounds per year for the first 12 months and 69,006 pounds per year thereafter.

2.3 AMBIENT MODELING

The site of this proposal is within an area that is in attainment or unclassified for all pollutants regulated by the national ambient air quality standards.

Criteria pollutant and toxic air pollutant emissions were modeled using ISCST3. The maximum concentrations of criteria pollutants are estimated at less than four percent, of all applicable State and Federal standards. Predicted emissions of some toxic air pollutants were less than their respective Small Quantity Emission Rate (WAC 173-460-080(2)(e)). The remaining toxic air pollutants were modeled using ISCST3. All modeled toxic air pollutants were estimated to be less than their respective Acceptable Source Impact Level (WAC 173-460-150 and WAC 173-460-160).

3.0 APPROVAL CONDITIONS

3.1 BACT

As required by WAC 173-400-113(2), November 22, 2000, this project shall use Best Available Control Technology (BACT) to control emissions of criteria pollutants. The following is considered BACT:

3.1.1 Oxides of nitrogen (NO_X) - NO_X shall be controlled by use of low NO_X duct burners, use of selective catalytic reduction (SCR) in the heat recovery steam generator (HRSG), and good combustion practice. Emissions shall be limited to 2 ppm_vd (at 15% O_2), 3-hour average.

3.1.2 Carbon monoxide (CO) - CO shall be controlled by use of an oxidation catalyst in the HRSG and good combustion practice. Emissions shall be limited to 2 ppm_vd (at 15% O_2), 1-hour average.

3.1.3 Volatile Organic Compounds (VOC) - VOCs shall be controlled by use of an oxidation catalyst in the HRSG and good combustion practice.

3.1.4 Sulfur Dioxide (SO_2) - SO_2 shall be controlled by exclusive use of natural gas and good combustion practice.

3.1.5 Particulate Matter (PM_{10}) - PM_{10} shall be controlled by exclusive use of natural gas and good combustion practice and design.

3.2 T-BACT

As required by WAC 173-460-040(4)(b), July 21, 1998, this project shall use Best Available Control Technology for Toxics (T-BACT). The following is considered T-BACT:

3.2.1 Toxic Air Pollutants (TAP) - TAPs shall be controlled by exclusive use of natural gas and good combustion practice.

3.2.2 Ammonia (NH_3) - Ammonia emissions shall be limited to 5 ppm_vd (at 15% O_2, 1-hour average) during the first 12 months of operation and 3 ppm_vd (at 15% O_2, 1-hour average) thereafter. Ecology may evaluate operating data from this facility after it is constructed to determine whether lower ammonia emission limits are achievable using the employed technology. If lower ammonia emission limits are found to be achievable, based on actual operation of the equipment as installed and permitted, Ecology may amend this Order to incorporate the lower emission limits.

3.2.3 Formaldehyde - Formaldehyde shall be controlled by use of the oxidation catalyst in the HRSG.

3.3 PRODUCTION

3.3.1 The source shall be limited to a generating capacity of less than 250 MW, measured using maximum continuous electric generating capacity, less minimum auxiliary load, at average ambient temperature and pressure.

3.3.2 The source shall operate at a load no less than 70%, except during periods of start-up and shut-down.

3.3.3 Use of the duct burners (operation at peak load) shall be no more than 5250 hours per rolling 12-month period.

3.3.4 Start-ups shall be limited to 50 times per rolling 12-month period.

3.3.5 No fuel other than natural gas shall be combusted in the combustion turbine and duct burners.

3.3.6 The combustion turbine shall operate only when the selective catalytic reduction (SCR) unit is operating in good order.

3.3.7 The backup generator and firewater diesel pump shall each be limited to 500 hours per rolling 12-month period of operation. The permittee shall operate the backup generator and firewater pump only as needed for maintenance and to provide emergency power or fire suppression water.

3.4 SPECIFIC CONDITIONS

3.4.1 The combined cycle unit shall not exceed the following emission standards:

Pollutant	Emission Limits Base-Load	Peak-Load	
Oxides of nitrogen (NO_X)	316.8	357.6	pounds per 24-hours, except during start-up
	2.0	2.0	ppm_vd at 15% O_2, 3-hour average, except during start-up
Carbon monoxide (CO)	8.0	9.1	pounds per hour, except during start-up
	2.0	2.0	ppm_vd at 15% O_2, 1-hour average, except during start-up
Sulfur dioxide (SO_2)	22.2	22.2	pounds per hour
	3.2	3.2	ppm_vd at 15% O_2, 1-hour average
Volatile organic compounds (VOC)	2.8	13.3	pounds per hour, except during start-up
	6.0	6.0	ppm_vd at 15% O_2, 1-hour average, except during start-up
Particulate Matter (PM_{10})	19.0	22.3	pounds per hour

Pollutant	Emission Limits Base-Load	Peak-Load	
Toxic Air Pollutants			
Acetaldehyde*	0.3182	0.3756	pounds per hour
Ammonia*	12.20	13.75	pounds per hour, during first 12 months of operation
	7.32	8.25	pounds per hour, following first 12 months of operation
	5.0	5.0	ppm_vd at 15% O_2, 1-hour average, during first 12 months of operation
	3.0	3.0	ppm_vd at 15% O_2, 1-hour average, following first 12 months of operation
Benzene*	0.0328	0.0388	pounds per hour
Formaldehyde*	0.4072	0.4806	pounds per hour
Nickel*	0.0036	0.0043	pounds per hour
Polyaromatic Hydrocarbon(PAH)*	0.0014	0.0016	pounds per hour
Propylene Oxide*	0.0496	0.0586	pounds per hour
Sulfuric Acid Mist (H_2SO_4)*	4.6	4.6	pounds per hour

* Toxic air pollutant with estimated emissions greater than the Small Quantity Emission Rate listed in WAC 173-460-080(2)(e).

3.4.2 Visible emissions from the emission units shall not exceed five (5) percent opacity.

3.4.3 Visible emissions, from the emission units, at the property boundary of the site shall not exceed zero (0) percent opacity.

3.5 TESTING

3.5.1 Within 60 days after achieving the maximum production rate at which the source will be operated, but not later than 180 days after the initial startup, the permittee shall conduct initial source tests, to be performed by an independent testing firm.

3.5.2 Source testing shall be conducted annually for each of the first three years of operation. Thereafter, source testing shall be required annually for each pollutant not meeting its respective emission limit(s) in Condition 3.4.1, for any of the previous three tests, and every five years for each other pollutant(s) in Condition 3.5.3.

3.5.3 The combined cycle unit shall be source tested for the following pollutants, using the specified method(s):

Pollutant	Test Method
Oxides of nitrogen (NO_X)	40 CFR 60, Appendix A, Methods 19 and 20, July 1, 1999
Carbon monoxide (CO)	40 CFR 60, Appendix A, Method 10, July 1, 1999
Sulfur dioxide (SO_2)	40 CFR 60, Appendix A, Methods 19 and 20, July 1, 1999
Volatile organic compounds (VOC)	40 CFR 60, Appendix A, Method 25A, July 1, 1999
Particulate Matter (PM_{10}) (All particulate matter shall be considered PM_{10}.)	Title 40, CFR, Part 60, Appendix A, Methods 5 or 17, and 19, July 1, 1999, and Title 40 CFR, Part 51, Appendix M, Method 202
Ammonia (NH_3)	Bay Area Air Quality Management District Source Test Procedure ST-1B, January 20, 1982
Sulfuric Acid Mist	40 CFR 60, Appendix A, Method 8, July 1, 2002
Opacity	40 CFR 60, Appendix A, Method 9, July 1, 1999

3.5.4 Each testing event (year) shall alternate between base-load and peak-load operating conditions.

3.5.5 Testing shall be conducted at a net power output of at least 225 MW, at ambient temperature and pressure.

3.5.6 Ecology shall be notified, and a test plan shall be submitted for approval by Ecology, at least 30 days prior to any required source testing.

3.5.7 Written results of all required source testing shall be submitted to Ecology within 60 days of occurrence.

3.5.8 Adequate sampling ports, safe sampling platforms and access to platforms, and utilities, for sampling and testing shall be provided by the permittee according to 40 CFR 60.8.

3.5.9 Each test shall consist of at least three runs.

3.5.10 Alternate methods of testing and alternate testing requirements may be proposed in writing to Ecology and may be used if approved by Ecology in writing.

3.6 MONITORING

3.6.1 On line monitors shall be referenced in the Operations and Maintenance Manual.

3.6.2 The permittee shall install, calibrate, maintain, and operate, Continuous Emission Monitors (CEMs) for NO_X, CO, O_2, and Ammonia, and a continuous stack flow rate monitor, with an automated data acquisition and handling system, that complies with 40 CFR Part 75 and 40 CFR 60, Appendix B, Performance Specifications, and 40 CFR 60, Appendix F, Quality Assurance Procedures.

3.6.3 The permittee shall monitor sulfur content of the fuel being fired in the turbine. This requirement may be satisfied by employing either Condition 3.6.3.1 or Condition 3.6.3.2, below.

3.6.3.1 Sulfur content shall be monitored daily with an on-site total sulfur analyzer.
3.6.3.2 Sulfur content shall be monitored by periodic on site gas sampling AND use of daily total sulfur analyzers monitoring each potential gas source.

3.6.4 The permittee shall monitor nitrogen content of the fuel being fired in the turbine.

3.7 RECORD KEEPING AND REPORTING

3.7.1 Records shall be kept of all periods of downtime of the monitors required by Condition 3.6.2.

3.7.2 A daily log shall be kept of the hours of operation in base load, operation in peak load, shut-down, and start-up.

3.7.3 A daily log shall be kept of the gross power generation and auxiliary load. The net power generation (gross power generation less the auxiliary load) shall be calculated and averaged, at average ambient temperature and pressure, over the most recent 12-month period, monthly.

3.7.4 Daily records shall be kept indicating the volume of ammonia maintained on-site and the volume of ammonia used.

3.7.5 A log of actual backup generator and firewater diesel pump operation shall be kept. The log shall identify the reason for operation, hours of operation, fuel type, fuel consumption, and fuel sulfur content.

3.7.6 Permittee shall keep records of complaints as received from the public, Ecology, or any other entity. Any complaints shall be promptly addressed and assessed. A record shall be maintained of the permittee’s action to investigate the validity of the complaint and what, if any, corrective action was taken in response to the

complaint. Ecology shall be notified within three (3) days of receipt of any complaint.

3.7.7 Records shall be kept as required under Title 40 CFR Part 60, Subparts Da and GG, and Title 40 CFR Parts 72, 73, 75, and 76.

3.7.8 CEMS reports shall be submitted at least monthly within 30 days of the end of each calendar month and in a format approved by the department which shall include but not be limited to the following:

3.7.8.1 Process or control equipment operating parameters.
3.7.8.2 The daily maximum and average concentration, in the units of the standard(s), for each pollutant monitored.
3.7.8.3 The duration and nature of any monitor down-time.
3.7.8.4 Results of any monitor audits or accuracy checks.
3.7.8.5 Results of any required stack tests.

For each occurrence of monitored (by CEMS or approved alternative methodology) emissions in excess of the standard the report shall include the following:
3.7.8.6 The time of occurrence.
3.7.8.7 Magnitude of the emission or process parameters excess.
3.7.8.8 The duration of the excess.
3.7.8.9 The probable cause.
3.7.8.10 Any corrective actions taken or planned.
3.7.8.11 Any other agency contacted.

3.7.9 Reporting required by Title 40 CFR Part 60, Subparts Da and GG; Title 40 CFR Parts 72, 73, 75, and 76, shall be submitted to Ecology and EPA.

3.7.10 Notification under Title 40 CFR Part 77 and WAC 173-400-107 shall be submitted to Ecology and EPA.

3.7.11 The permittee shall notify Ecology in writing at least ten (10) days prior to initial startup.

3.7.12 Records of all data shall be maintained in a readily retrievable manner for a period of five (5) years and be made available on-site to authorized representatives of Ecology upon request.

3.8 OPERATING & MAINTENANCE

The emission units shall be properly operated and maintained. Emission unit specific operating and maintenance (O&M) manuals shall be developed and followed by the permittee. Manufacturer's instructions may be referenced. O&M manual development shall be completed within 30 days of installation of each emission unit. The O&M

manual shall be updated to reflect any modifications to the emission units or operating procedures. The emission units shall be operated and maintained in accordance with the O&M manual. Failure to follow the O&M manual and the adequacy of the O&M manual will be two of the factors considered by Ecology in determining whether the emission units are properly operated and maintained. Regular O&M records shall be kept at the source. These O&M records shall be available for inspection by Ecology, organized in a readily accessible manner, and retained for at least five (5) years. The O&M manual shall at a minimum include:

3.8.1 Normal operating parameters for the emissions unit(s);

3.8.2 A maintenance schedule for the emissions unit(s);

3.8.3 Monitoring and record keeping requirements;

3.8.4 A description of the monitoring procedures; and

3.8.5 Actions for abnormal control system operation.

3.9 GENERAL CONDITIONS

3.9.1 No outdoor burning shall be conducted at the source.

3.9.2 Odors from the source shall be controlled by preventing unnecessary release of ammonia, natural gas and other substances producing obnoxious odors at ground level and by minimizing such emissions from the exhaust stack. In the event that odor from the project is detected beyond the property boundary of the project, Ecology or the permittee shall promptly notify the other of this fact. Within 30 days following such detection, the permittee shall determine what remedial measures will be taken, to control odor. Within 60 days following such detection, the permittee shall implement the remedial measures, unless installation of new equipment is required. If the remedial measure includes the installation of new equipment, such measure shall be taken within 180 days following such detection. The permittee shall report in writing to Ecology on remedial measures effectiveness. In the event that odor from the project is detected beyond the property boundary of the project following notification and this remedial action period, Ecology may order the permittee to take specific measures to control odor. These measures subject to approval by regulatory agencies where appropriate may include, but are not limited to, increase in exhaust stack height and installation of capture and treatment systems at locations at which ammonia and other odor-causing substances are used.

3.9.3 Legible copies of this Order and the O&M Manuals shall be on-site in a location known by and available to personnel in direct operation of the emission units and available to Ecology upon request.

3.9.4 Access to the source by the United States Environmental Protection Agency or the Department of Ecology shall be permitted upon request for the purposes of compliance assurance inspections. Failure to allow access is grounds for revocation of this Order.

3.9.5 Nothing in this Order shall be construed so as to relieve the permittee of its obligations under any state, local, or federal laws or regulations.

3.9.6 It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order.

3.9.7 This Order shall become invalid if construction is not commenced within 18 months after receipt of final approval, if construction is discontinued for a period of 18 months or more, or if construction is not complete within a reasonable time. Ecology may extend the 18-month period upon a satisfactory showing that an extension is justified.

3.9.8 It shall be grounds for rescission of this approval if physical operation is discontinued for a period of eighteen (18) months or more. Ecology may extend the 18-month period upon a satisfactory showing that an extension is justified.

3.9.9 Operation of equipment must be conducted in compliance with all data and specifications submitted as part of the Notice of Construction application unless otherwise approved by Ecology. Any activity undertaken by the permittee, or others, in a manner that is inconsistent with the application or this Order, shall be subject to Ecology enforcement under applicable regulations.

3.9.10 In the event that the Washington State Parks and Recreation Commission reports in writing to Ecology that the project has interfered with viewing by the Goldendale Observatory, Ecology shall notify the permittee of this fact. Within 180 days following such notification, the permittee shall implement remedial measures to ensure that no interference with viewing at the Goldendale Observatory occurs and shall report in writing to Ecology on their effectiveness. In the event that an instance of interference by the project with viewing at the Goldendale Observatory is reported in writing to Ecology by the Washington State Parks and Recreation Commission following notification and this remedial action period, Ecology may order the permittee to take specific measures. These measures subject to approval by regulatory agencies where appropriate may include, but are not limited to, changes in cooling technology and fuel limitations. The basis for Condition 3.9.10 is WAC 173-802-110.

A two-week testing and break-in period is allowed, after any part or portion of this project becomes operational, to make any changes or adjustments required to comply with applicable rules and regulations pertaining to air quality and conditions of operation imposed herein. Thereafter, any violation of such rules and regulations or of the terms of this approval shall be subject to the sanctions provided in Chapter 70.94 RCW.

Authorization may be modified, suspended or revoked in whole or part for cause, including, but not limited to, the following:

I. Violation of any terms or conditions of this authorization;

II. Obtaining this authorization by misrepresentation or failure to disclose fully all relevant facts.

The provisions of this authorization are severable and, if any provision of this authorization of application of any provision to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this authorization, shall not be affected thereby.

Any person feeling aggrieved by this ORDER may obtain review thereof by application, within the time period specified in Chapter 43.21B RCW to the Pollution Control Hearings Board, PO Box 40903, Olympia, Washington 98504-0903. Concurrently, a copy of the application must be sent to the Department of Ecology, PO Box 47600, Olympia, Washington 98504-7600 and to the Department of Ecology, 15 West Yakima Avenue, Suite 200, Yakima, Washington 98902. These procedures are consistent with the provisions of Chapter 43.21B RCW and the rules and regulations adopted thereunder.

DATED at Yakima, Washington, this 22nd day of August, 2003.

REVIEWED BY:

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Lynnette A. Haller, PE
Central Regional Air Quality Section
Department of Ecology
State of Washington

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